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O. Yu. Ivanova

*Research Center of Industrial Problems
of Development of National Academy of Sciences of Ukraine,
Kharkov, Ukraine*

O. Yu. Polyakova

*Research Center of Industrial Problems
of Development of National Academy of Sciences of Ukraine,
Kharkov, Ukraine*

TAX ASPECTS OF FINANCIAL RESOURCES DECENTRALIZATION

ABSTRACT. The article is devoted to topical issues of socio-economic development of regions through decentralization of financial resources in terms of reallocation of tax revenue. The methodical approach to modeling scenarios of adjusting the tax component of the regional fiscal policy, which consists of five interrelated sequential steps: setting goals; building a model of adjusting the tax component of the regional fiscal policy; identifying the impact of the factors on developing the financial self-sufficiency of regional development; identifying scenarios of tax revenue reallocation between the budgets of different levels; recording potential risks; developing performance criteria for financial resource decentralization and checking scenarios for their compliance; modeling scenarios; selection of the most rational scenario in accordance with economic, social, and organizational effectiveness. In order to identify the most effective options of adjusting the tax component of the regional fiscal policy the article considers four possible scenario variants: the scenario for 2011–2014 years; the governmental scenario for 2015; two scenarios proposed by the authors in terms of securing a share of national taxes to local budgets. For each scenario it considers the risks and the related losses of budgetary funds: temporary, transactional and corruption risks. To model the scenarios, a simulation model of the regional financial resources dynamics using the example of the local budget of Kharkov in the Vensim medium has been built. Modelling the proposed scenario variants has shown deterioration in the scenario 2 of both the budget dependence coefficient and the level of the budget balance in comparison with the pre-existing conditions in 2014. Improvement in the budget dependence indicator and the balance as compared with the retrospective period is achieved in the fourth scenario under consideration. At that, there is a reduction of the volume and the share of the intra-budget transfers and related losses. Legislative recognition of responsibility for implementing reallocated functions will allow to increase their efficiency.

KEYWORDS. Taxes; tax revenue; local taxes; decentralization; financial resources; regional development; financial self-sufficiency; inter-budget relations, fiscal relations; simulation modelling.

О. Ю. Иванова

*Научно-исследовательский центр индустриальных проблем развития Национальной академии наук,
г. Харьков, Украина*

О. Ю. Полякова

*Научно-исследовательский центр индустриальных проблем развития Национальной академии наук,
г. Харьков, Украина*

НАЛОГОВЫЕ АСПЕКТЫ ДЕЦЕНТРАЛИЗАЦИИ ФИНАНСОВЫХ РЕСУРСОВ

АННОТАЦИЯ. Статья посвящена актуальным вопросам обеспечения социально-экономического развития регионов путем децентрализации финансовых ресурсов на основе перераспределения налоговых поступлений. Разработан методический подход к моделированию сценариев корректировки налоговой составляющей региональной фискальной политики, который включает несколько взаимосвязанных последовательных этапов: постановка цели; построение модели корректировки налоговой составляющей региональной фискальной политики; установление влияния факторов на формирование финансовой самодостаточности регионального развития; определение сценариев перераспределения налоговых поступлений между бюджетами разных уровней; учет потенциальных рисков; формирование критериев эффективности децентрализации финансовых ресурсов и проверка сценариев на соответствие им; моделирование сценариев; выбор наиболее рационального сценария в соответствии с экономической, социальной и организационной эффективностью. С целью выявления наиболее эффективных вариантов корректировки налоговой составляющей региональной фискальной политики рассмотрены четыре варианта сценария (механизмы изменения налогового и бюджетного кодексов Украины на 2011–2014 гг.; предложения правительства на 2015 г.; два авторских сценария, предложенных в части закрепления доли общегосударственных налогов за местными бюджетами). По каждому из них учитывались временные, транзакционные и коррупционные риски и потери бюджетных средств. Для моделирования сценариев построена имитационная модель динамики финансовых ресурсов региона на примере местного бюджета г. Харькова в среде Vensim. Моделирование предложенных вариантов сценариев показало, что в правительственном сценарии коэффициент бюджетной зависимости, и уровень сбалансированности бюджета ухудшаются по сравнению с условиями, действовавшими до 2014 г. Их улучшение по сравнению с ретроспективным периодом достигается в одном из авторских сценариев, при этом происходит сокращение объема и доли межбюджетных трансфертов и связанных с ними потерь. Законодательное закрепление ответственности за выполнение перераспределенных функций позволит повысить их эффективность.

КЛЮЧЕВЫЕ СЛОВА. Налоги; налоговые поступления; местные налоги; децентрализация; финансовые ресурсы; региональное развитие; финансовая самодостаточность; межбюджетные отношения; имитационное моделирование.

The topicality of research. Strengthening the competitive position of the state, improving the socio-economic development of its regions actualizes the need to create conditions for self-development of regions based on their self-sufficiency including building an efficient fiscal policy. The tax component of the

regional self-development promotion needs reallocation of tax revenue between the budgets of different levels, depending on the degree of local authorities influence on them.

Problems of socio-economic development of regions arise under influence of many factors (the regional

financial dependence of the center is one of them), which is observed in many countries, both at federal and regional levels.

The main causes of the regional financial dependence are: lack of coordination of interests of the budgets at governmental, regional and local levels; restriction of rights of local governments; lack of adequate funding delegated to the authorities; disparity of social and economic development of their areas in terms of financial support; unsustainable cash flow budget accompanied by loss of time and money and corruption risks; irrational structure of local budgets; lack of incentives for regional self-development.

An increased local budget revenue by stimulating local authorities to perform regional self-development through decentralization of financial resources is a topical task for many countries.

Extent of research and development under discussion. The interest in the issues of regional development based on empowerment of local governments and local communities significantly increases along with the need for rational use of budgetary funds.

Significant attention of domestic and foreign scientists and economists (P. Belenky, P. Bubenko, Z. Varnaly, Z. Gerasimchuk, I. Degtyareva M. Dolishny, L. Kowalska, D. Kuzmin, M. Porter, M. Stepanov, A. Sokolov, D. Stechenko, A. Tatarkin, L. Yaremkо) is paid to the issues of regional competitiveness, ensuring sustainable competitive position in the region and the role of governmental regulation of these processes. Considerable attention is paid to the financial support of socio-economic development of regions in works of national and foreign academic economists: I. Vakhovich, Z. Gerasimchuk, L. Kalashnikova, V. Kravchenko, A. Melnik. Studies of fiscal relations between the regions and the center are described in scientific works of I. Alekseyev, T. Bondaryuk, V. Vishnevsky, Yu. Ivanov, I. Mayburov, I. Lunina A. Sokolovskaya, L. Tarangul. Works of such classics, as J. Bodin, W. Petty, T. Hobbes, J. Locke, F. Quesnay, J. Sonnenfels, A. Smith, D. Ricardo, A. Marshall,

H. Rau, R. Musgrave, J. Stiglitz are devoted to studying public finances. The process of decentralization and problems of its implementation is investigated in scientific works of A. Belispayev, N. Bikadorova, A. Bondarenko, N. Kaminskaya, I. Karchevskaya, S. Kolodiya, O. Kraynyk, I. Legkostup, Yu. Ostrischenko etc. However, the practical aspects of deregulation require a scientific basis, including the redistribution of taxes between the budgets of different levels.

The aim of the article is to investigate selection of effective decentralization scenarios of financial resources by reallocating tax revenues among the budgets of different levels based on the simulation method.

Statement of the basic material. Historical background of centralized governmental prevalence in post-Soviet countries is responsible for a significant intervention center in regional development. When control is concentrated in the center, decision-making management of further regional development is centralized, and implementation of these decisions is imposed on the regional and local authorities. At the same time, governments at lower levels are deprived of many rights in management of regional economic growth. An objective assessment of regional needs, the definition of «growth points», problems and their possible solutions should be a priority responsibility of local authorities.

The effectiveness of regional development management should increase with the transfer of powers to local authorities and relevant delegation of responsibility to encourage local authorities to improve the efficiency of the implementation of their mandate.

So, the decentralization is viewed as the transfer of powers and responsibilities for decision-making from the center to other organizations. As part of the public sector, decentralization means that decisions are not made by the central government, and local and regional authorities [1].

Also, decentralization is a reduction of governmental control, promotion of

partnership between the government and the private sector, a policy that both promotes an increase in private capital markets of the country and increases competition.

B. Raizberg and L. Lozovsky consider decentralization as a transfer of management functions from central government to local authorities, expansion of the powers of the lower controls due to higher ones [2].

Decentralization of authority, which is a prerequisite for regional development based on self-sufficiency, does not mean complete exclusion of the government from interfering in the process of regional development. It provides expansion and strengthening of the rights of local governments, however, some features that are less effective at the local level are left for the center.

Decentralisation in the field of regional development contributes to solving the following problems:

- reducing and eliminating the negative impact of governmental intervention in regional development;
- creating favorable conditions for self-development and self-sufficiency of regions of Ukraine by reducing governmental regulation in order to increase their competitiveness;
- providing a legal platform for increasing independence of local governments to achieve regional self-development on the basis of maximizing the efficiency of their potentials;
- strengthening institutional and motivational factors of regional socio-economic development interaction;
- creating incentives to improve the financial sustainability of regions by increasing the role of regional authorities in socio-economic development of the regions;
- reducing corruption risks in the reallocation of budget funds, etc [3, p. 46–47].

Also, we should agree with V. Podgorny, who argues that «distribution of governmental and regional authorities is a very complicated issue, primarily associated with harmonization of national and

regional interests. From this perspective, the system of governmental regulation in management of the regions should be considered within the overall system of governmental regulation of the economy» [4, p. 8].

It should be noted that the majority of scientists focus on the need to ensure almost complete regional independence in solving many issues related to their functioning. However, the granting of absolute autonomy, including tax autonomy may, over time, lead to even greater dependence of local budgets from the government. Therefore, an important priority for Ukraine in implementing an effective regional policy is a gradual transition from a centralized method of governmental regulation of these aspects to decentralized one. In this case, we should also agree with M. Karasev, who draws an attention to the fact that «we should talk about the need for detailed regulation and a clear division of fiscal powers between the various levels of governmental authority and local self-government» [5, p. 122]. However, as S. Varnaly indicates «financial equalization should be applied not only to the approximation of standards of social services to the population throughout the country, but also as a tool to stimulate economic development in each region with the need to take into account all the strengths and weaknesses in economic conditions and available infrastructure» [6, p. 346]. Financial support of local budgets should be based on endogenous potential, and, therefore, an intensification of economic and business activities of local authorities in order to increase the share of own sources of income and fixed assets in the local budgets and reducing the share of transfers, as well as an increase in the overall number of regions that do not require substantial transfers from the state budget (the motivational component of regional development) is needed. The use of regional policy instruments to encourage the revitalization of the economic agents will boost the incomes of enterprises, entrepreneurs, households which will broaden the tax base and thus increase tax revenue to local budgets.

A. Tatarkin and D. Tatarkin consider the self-development of territorial economic systems as «sustainable capacity of the region (municipalities) in terms of prevailing in the community macro-environment to ensure the expanded reproduction of the gross regional product at the expense of its own available resource potential opportunities and revenue sources for implementation of both macroeconomic objectives and national priorities and intra-regional target settings» [7]. Academician A. Tatarkin sees in the definition of «self-development» an important condition for the state's competitiveness — a combination of regional and national interests, which is important in maintaining the integrity of the state. The papers [3; 7–9] substantiate that by creating conditions for self-financing the regional costs can be based on the principles of fiscal federalism.

S. Grinevskaya says that «improving inter-budgetary relations in development of the priority areas of self-development is an innovative tool for building effective regional economy due to the financial support of the regional government functions» [10].

Decentralization of authority provides a management system, according to which there is a redistribution of responsibilities between the central government and local authorities in favor of the latter.

The regions should have more opportunities to make decisions at the local level in regard to the health care development, education management, public utilities, and humanitarian sphere of business activity, the structure of local taxes, etc. Upholding the responsibility for implementing redistribution of functions will enhance their effectiveness.

Decentralization of authority contributes to reducing the negative impact of governmental intervention in the regional development, it promotes self-development on the basis of a clear definition of the urgent problem area and prospects of using the potential of available resources, creates conditions for improving regional financial sustainability by increasing the role of

regional authorities in socio-economic development of regions (Figure 1).

It should be taken into account the risks associated with providing greater freedom to local authorities: arbitrariness of local officials, spread of corruption schemes, growing discontent of the population and the authorities, etc. It requires a sequence of this process, taking into account the world experience of authority's decentralization reform and legislative consolidation of a wide circle of official responsibilities.

Decentralization does not provide removing the government from interfering in the process of regional development, its focus is to expand and strengthen the rights of local governments, however, some features that are less effective at the local level should be left to the competence of the central authorities.

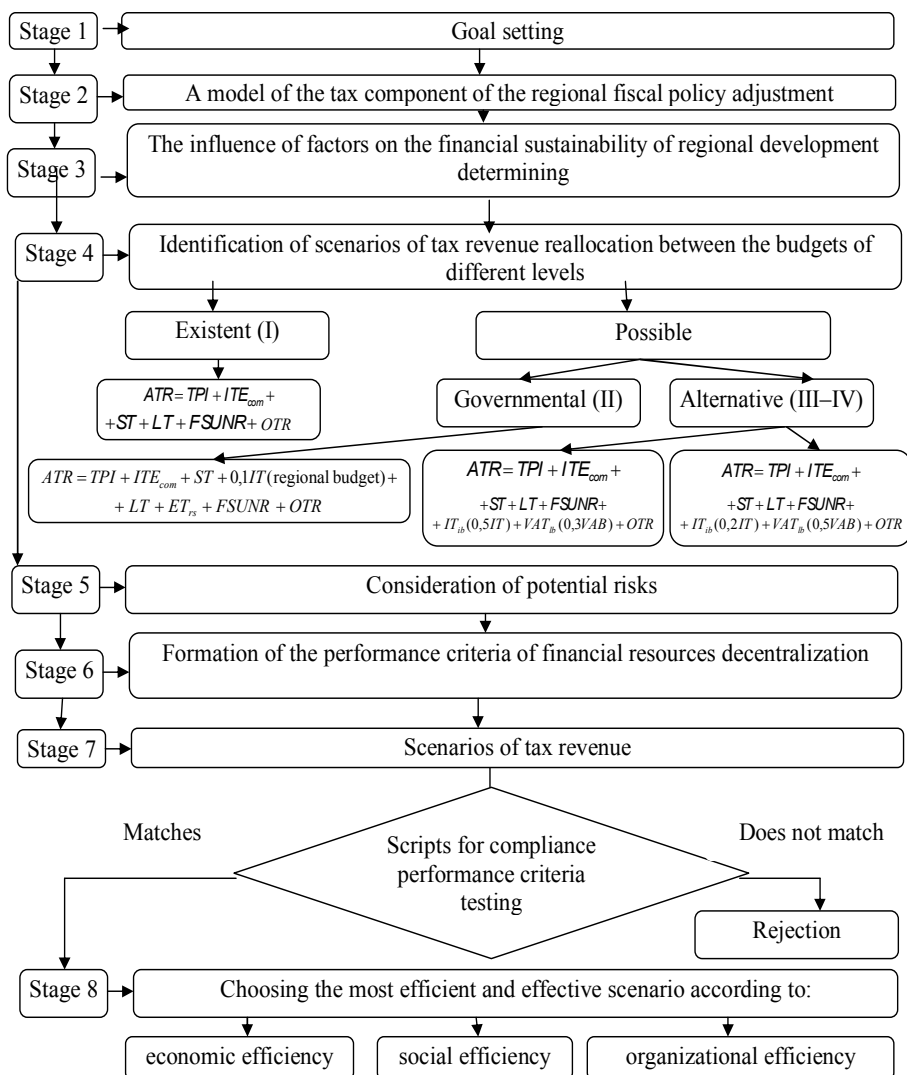
The need for a rational redistribution of management functions between the higher and lower levels, as well as their financial security on the basis of improving regional self-funding, determine the feasibility of a gradual transition to the principles of fiscal federalism.

The model of fiscal federalism involves a special form of intergovernmental relation construction on the basis of consolidation of the regional authorities, the right to receive income and rational disposal costs. That assumes autonomy of functioning of budgets at different levels of government, taking into account the interests of all levels of the hierarchy.

The basic idea of fiscal federalism is to create conditions for self-financing the regional costs. Ensuring local revenues increase is possible by forming such a list, and such a size of local taxes, which is possible due to the maintenance of normal social and economic development of the region.

The rational choice of tool options of financial resource decentralization based on the tax component of the regional fiscal policy adjustment for each scenario requires a scientific study (Figure 2).

1. At the first stage of the methodical approach formulating the goal is substantiation of the choice of effective



Note. TPI – tax on personal income, mln UAH; ITE_{com} – income tax of enterprises of communal ownership, mln UAH; ST – single tax for small businesses, mln UAH; LT – local taxes, mln UAH; ET_{rs} – the excise tax on retail sales of excisable goods, mln UAH; FSUNR – fees for special use of natural resources, mln UAH; VAT_{ib} , IT_{ib} – value added tax, corporate income tax which is assigned to the local budgets, mln UAH; OTR – other tax revenues in the budgets of the regions, mln UAH.

Figure 1. Methodical approach to modeling scenarios of adjusting the tax component of the regional fiscal policy

decentralization scenarios of financial resources among the budgets of different levels.

2. The next step is to build a model of financial resource decentralization. At this stage, indicators and their parameters that will be included in the model are selected, factors that influence the change of baseline parameters are specified and logical connections are built.

The indicators in the model of financial resource decentralization can be: the level of regional budget balances, the amount of own revenue of local budgets, the amount of total revenue of local budgets, budget dependence index of regional budgets, total tax revenue and tax revenue assigned to local budgets, and others. The parameters are the tax rates, the share of local budget consolidation.

Also it should be taken into account the indicators that influence parameters of the main indicators: the level of wages in the region, per capita income, industrial production, unemployment rate, losses from movement of the budgetary funds to

the center and back, economically active population, unemployed population, etc.

At the same stage, forward and backward links between the components of the model are to be set.

3. The third step of the methodological approach is identifying factor influences on financial sustainability of regional development. These factors include: orientation of regional policy, tax, budget and resource potential of the region, the amount of tax revenue, relationship between government and business in the region, economic structure of the region, presence of their own universities, the level of the business development, consequence of the economic policy decisions in regard of the subjects and actions at the level of the region, etc.

At this stage, the direction of the factor influences on the basic parameters of the model is specified. Thus, the increase of tax revenue, particularly, of the corporate income tax, will depend on the population of the region, the solvency of the population, unemployment, inflation,

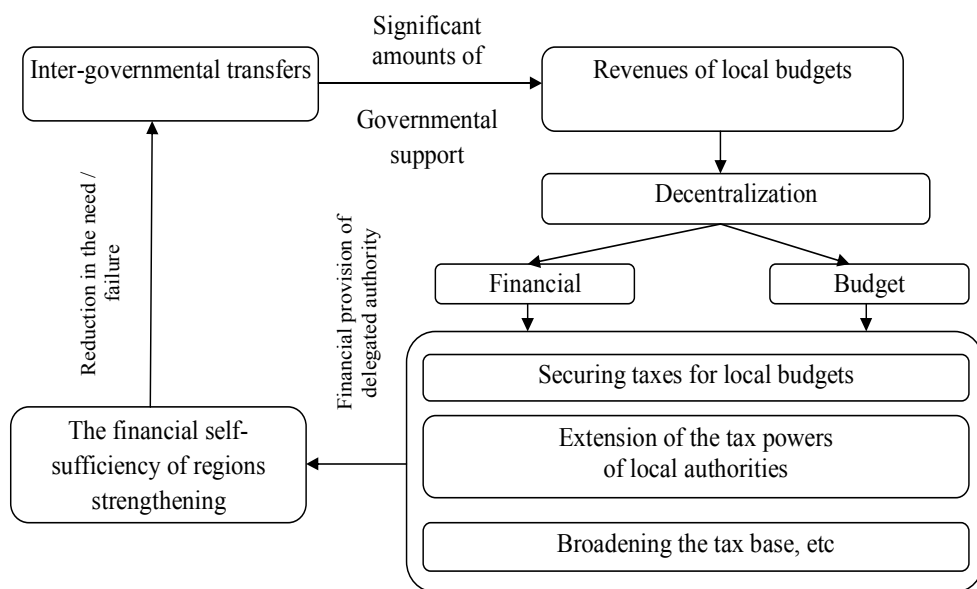


Figure 2. Influence of decentralization on financial self-sufficiency of regions

the consumer price index, exchange rate, etc. Accordingly, the increase or decrease of one of them will negatively or positively affect the amount of income tax of enterprises. All these must be considered when building the model.

4. At the fourth stage the script variants of financial resource decentralization are developed.

The basis of the model is data and conditions according to characteristics of the transformation processes in Ukraine. But the problems of setting local budget financial self-sufficiency and financial support of the delegated functions remain relevant for many countries, including Russia.

Lack of own source of revenue in local budgets leads to increasing financial dependence on the center, making it impossible to perform expenditure commitments at their own expense. For example, in Ukraine, the share of transfers in the local budget revenue in 2000 amounted to 28,9 %, in 2005 – 47,3 %, in 2011 – 53,7 %, in 2013 – 52,4 %, January – September 2014 – 55,4 %¹. In most EU countries this proportion is much lower (for example, in Germany – 22 %, and in Sweden – 34 %), which means a higher level of financial autonomy of local governments in Europe. However, the share of intergovernmental transfers in the total revenue of local budgets in the Russian Federation for the year 2012 amounted to 61,8 %². Government subsidies in the structure of local budgets in the USA make up 1/4 of, in France – 1/3, in Germany, Japan, Denmark – 40–45 %, in Belgium – more than 50 %. Communities in Italy get about 80 % of their revenue by transfers from the governmental budget [11].

To achieve this goal, we suggest multi-criteria scenarios of financial resource decentralization of local budgets in the form of governmental taxes redistribution between the budgets of different levels (Table 1).

The first scenario is based on the mechanism of local budget formation after the changes in the Tax and Budget Codes of Ukraine in 2011. In spite of the significant changes and growth in local revenue of local taxes and fees, the dependence of local budgets from the center increases every year, which indicates the need for reforming the financial resource decentralization.

As A. Kaspruk notes «a significant proportion of the budget's income takes revenue from state taxes. This indicates an insufficient level of local authorities independence and a reduction of local authorities' interest in ensuring the full revenue, especially the tax. The system of local budgets formation from the "top" is characterized by absence of effective incentives for local governments to develop their own tax base, which depends on the region's economic development, its social and industrial infrastructure» [12].

The second scenario reflects the Government's proposals for 2015 that provides fixing 10 % corporate income tax to local budgets and introducing a local excise tax which is made payable when trading excise goods at retail. Local councils establish the local excise rates (5 %).

Indeed, the list of taxes, in part assigned to local budgets, should include primarily those taxes the tax base of which can be influenced by local authorities. These include the corporate income tax and the excise retail sales tax. The excise tax to the local budget is paid by business entities' retail sales of alcohol, tobacco, certain types of fuel.

The use of enabling instruments will actually lead to an increase in sales volume and thus increase the amount of taxes paid, i. e. to the economic effect for the subjects of fiscal relations. However, in the case of alcohol and tobacco, we have two divergent effects: a positive economic impact and negative social effect. Encouraging sales by local authorities will lead to increased consumption of alcohol and tobacco products. In turn, this may lead to an increase in unemployment, an increase in crime in the region, declining birth rates, etc., that is a destructive factor of socio-economic development of the re-

¹ Site data of the State Treasury Service of Ukraine. URL: <http://treasury.gov.ua/main/uk/index>.

² Сайт газеты Зеркало недели. URL: http://dt.ua/ECONOMICS/v-ukrayini-miscevi-byudzheti-bilsh-zaleznyi-vid-transfertiv-z-derzhbyudzhetu-nizh-uyes-132498_.html.

gion. Therefore, the type of tax is absent in the scenarios proposed by authors.

Activation of the local government's position in fiscal relations and active involvement of local authorities in the process of tax regulation puts a new emphasis on the issue of the taxes and fees list, partially belonging to a local budget.

The most expedient is inclusion this taxes and fees list the amount of which is directly or indirectly linked with the efforts of local authorities in the field of socio-economic development of regions.

For example, the amount of income tax of enterprises partly depends on how successful the efforts of local authorities are in creating the conditions for effective management in the region, developing market infrastructure (promotion of innovative scientific and industrial clusters, implementation of regional target complex programs, etc.). Receipt of the value added tax for each of the regions defined by including the purchasing power of the population and the level of the trade network development in the region. Therefore, exemplary state taxes can be attributed to the fixable taxes and fees [8, p. 232–233].

Therefore, scenarios 2 and 3 are aimed at creating conditions for strengthening the regional financial sustainability through consolidating the share of corporate income tax to local budgets.

Expansion of financial resources through consolidating national taxes to the regional budgets will increase the indicator of a balanced budget, which is defined as the ratio of own revenues to expenditures of the respective budgets and, hence, to increasing the financial autonomy of the regions [3, p. 250].

5. The risks that arise in the process of budgetary funds movement and have a direct impact on the parameters of the model, should be taken into account in the simulation scenarios of financial resource decentralization.

Current system of inter-budgetary relations is characterized by very significant counter-flow: the amount of governmental taxes receipts from the regions to the center, and in the opposite direction – from the center to the regions – the amount

of subsidies, subventions and subsidies moves. Such a large-scale movement of financial resources is associated with the losses, both objective and subjective ones.

The first group includes the losses are not directly related to the «human factor». These include: the loss of «transactional nature» due to the objective need for movement of financial flows (payment of the State Treasury and the banking system services, compensation for the employees involved in the relevant processes and monitorings, etc.), and secondly, the loss of time.

Regarding the second one, it should be clarified that the recovery funds in the form of taxes, then reallocated in the same local budget, are withdrawn from circulation for this period. In turn, it «pushes» the time of receipt of the final social result from their use. It is clear that the degree of «bureaucratization» of this process directly affects the value of these temporary losses.

Subjective losses are linked with an increased risk of corruption due to the presence of the human factor at each stage of the financial resource movement.

6. The criteria for the effectiveness of the financial resource decentralization are: decline of budgetary dependence index, increase in the budget balance in the region, increase in tax revenue to local budgets, increase in the share of local and fixed taxes, positive social impacts, reduction of budget funds losses, reduction of the corruption risks, etc.

For example, the ratio of inter-governmental transfers and own revenue in the total revenue of local budgets in Ukraine is as follows: inter-governmental transfers are an average of 55 % and their own income – 45 %. But the experience of European countries shows the feasibility of reducing the share of inter-governmental transfers to 0,2–0,4³.

7. Choice of a rational scenario is carried out by using simulation. Using the simulation is carried out to assess the effects of changes in the land tax for construction, urban employment and business

³ URL: http://dt.ua/ECONOMICS/v-ukrayini-miscevi-byudzheti-bilsh-zalezni-vid-transfektiv-z-derzh-byudzhetu-nizh-u-yes-132498_.html.

Table 1

Variants of scenarios of national taxes distribution between the budgets of different levels

Indicators for the model of financial resources' decentralization	Scripts (variants of local budgets formation at the expense of tax revenues)			
	Scenario 1 (2011–2014 years)	Scenario 2 (Government's proposal for 2015)	Scenario 3 (author's version)	Scenario 4 (author's version)
1	2	3	4	5
Level of regions budgets balance L_{bf} , the proportion of units	$L_{bf} = \frac{OR}{C},$ <p>OR – own revenues of budgets, mln. UAH; C – costs of regions, mln. UAH</p>			
Own revenue of local budgets OR, mln. UAH	$OR = LT + ATR + NTR + CR + FR,$ <p>LT – local taxes, mln. UAH; ATR – tax revenues assigned to the region's budget, mln. UAH; NTR – non-tax revenue in the budgets of regions, mln. UAH; CR – revenue of regional budgets from capital transactions, mln. UAH; FR – revenue of regional budgets trust funds, mln. UAH</p>			
Total revenues of local budgets TR, mln. UAH	$TR = OR + IGT,$ <p>IGT – intergovernmental transfers, which are listed in the budgets of the regions from the state budget, mln. UAH</p>			
Budget dependence index of regional budgets I_{bd} , the proportion of units	$I_{bd} = \frac{IGT}{TR}$			
Tax revenues assigned to the region's budget ATR, mln. UAH	$ATR = TRI + ITE_{com} + CT + LT + FSUNR + OTR$	$ATR = TRI + ITE_{com} + ST + 0,1IT(\text{regional budget}) + LT + ET_{ns} + FSUNR + OTR$	<p>In the case of fixing of the regional budget share (20 %) of corporate income tax, excluding the income tax of enterprises of communal ownership, the proportion of VAT (20 %):</p>	
	<p>In the case of fixing of the region's budget share (50 %) of corporate income tax, excluding the income tax of enterprises of communal ownership, the proportion of VAT (20 %):</p>			

Continued Table 1

1	2	3	4	5
Tax revenue assigned to the region's budget ATR , mln UAH			$ATR = TRI + ITE_{com} + ST + LT + FSUNR + IT_{lb} + VAT_{lb} + OTR$	$ATR = TRI + ITE_{com} + ST + LT + FSUNR + IT_{lb} + VAT_{lb} + OTR$
Income tax is assigned to the local/subfederal budgets IT_{lb} , mln UAH	–	$IT_{lb} = IT \cdot S_{lb} = T_r \cdot T_b = 0,18 \cdot T_b \cdot 0,1$	$IT_{lb} = IT \cdot S_{lb} = T_r \cdot T_b = 0,18 \cdot T_b \cdot 0,2$	$IT_{lb} = IT \cdot S_{lb} = T_r \cdot T_b = 0,18 \cdot T_b \cdot 0,5$
IT — general income tax revenue, mln UAH; T_r — tax rate, share; T_b — tax base, UAH; S_{lb} — share of total tax fixing for the budget of the region, share.				
Value added tax is assigned to the local/subfederal budgets VAT_{lb} , mln UAH	–	–	$VAT_{lb} = VAT \cdot S_{lb} = T_r \cdot T_b = 0,2 \cdot T_b \cdot 0,5$	$VAT_{lb} = VAT \cdot S_{lb} = T_r \cdot T_b = 0,1 \cdot 2T_b \cdot 0,3$
VAT — general value added tax revenue, mln UAH				
Tax on personal income TPI , mln UAH	+	60 % — cities of regional value and districts 15 % — regional budget 20 % — Kyiv	60 % — cities of regional value and districts 15 % — regional budget 20 % — Kyiv	60 % — cities of regional value and districts 15 % — regional budget 20 % — Kyiv
The excise tax on excisable goods (products) produced in Ukraine E_{rs}	–	The excise tax on retail sales of excisable goods (beer, alcoholic beverages, tobacco products, petroleum and others, fuel) 5 %	–	–

activity [13]. It indicates the efficiency of this method for solving such problems.

A simulation model of the dynamics of regional financial resources using the example of the local budget of Kharkov is built to simulate scenarios. To build the model, we used data of Main Department of Statistics in Kharkov Oblast, Main Department of the State Treasury of Ukraine in Kharkov region, Department of Budget and Finance of the Kharkov City Council, Main Department of the Ministry of income and fees in Kharkov for the years 2011–2014 and in whole Kharkov Oblast for the years 2006–2011. A simulation model was implemented in the Vensim medium 5.7 a⁴.

The diagram of causality simulation model is shown (Figure 3).

Dependences used in the simulation model were evaluated using the historical data and are shown (Table 2).

An evaluation of the possible effect of the introduction of the retail sales excise tax of excisable goods was carried out on the basis of forecasting enterprises' retail

turnover in the region, taking into account the proportion of Kharkov population. The relevant information about the dynamics of indicators for the 1st quarter of 2015 was taken into account in calculations for the perspective period of 2015–2017. Variables that are not listed in the Table 2 were modeled as normally distributed random variables with the appropriate parameters.

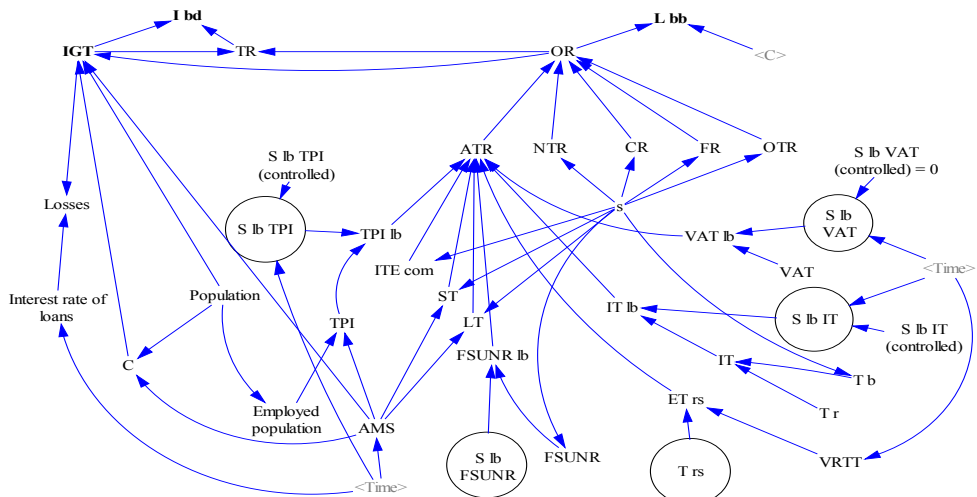
The amount of inter-governmental transfers is adjusted by the average rate of interest on loans (18 % in 2011, 30 % in 2015) for the calculation of the losses associated with time-consuming inter-budgetary relations, which are on the average from 1 to 3 months of the year.

Considering a short length of the retrospective period and the possible random deviations in obtaining an estimate of the resulting values, each scenario was simulated several times at different values of the random variables. The results were processed using the tool «Data Analysis» MS Excel 7.0.

The simulation results are shown in Table 3–4.

Volumes of securing tax revenues for the budget of Kharkov depending

⁴ The Ventana's modeling environment. Vensim® PLE for Windows, Version 6.1c. URL: <http://vensim.com/vensim-software>.



Note. Designations of the variables correspond to the table 1; parameters of scenarios identifies: S lb TPI – share of tax on personal income for the regional budget; S lb IT – share of total tax fixing for the regional budget; S lb FSUNR – share of FSUNR for the regional budget; S lb VAT – share of VAT for the regional budget «controlled» means that the variable is a parameter of simulation.

Figure 3. The structure of the simulation model of the tax component of the regional fiscal policy adjustment using the example of Kharkov

Table 2

Basic relations of the simulation model

Variable	Function	R^2
The average monthly salary (AMS)	$y = 633,3 \ln(t) + 2041$	0,97
Individual income tax	$y = 0,30955 \text{ AMS}^{1,1007} \text{ Employed population}^{0,00228}$	0,95
Local taxes and fees	$y = 1337 \ln(\text{AMS}) - 10279$	0,98
Single tax	$y = 1303 \ln(\text{AMS}) - 10032$	0,98
The volume of retail trade turnover	$y = 0,53(563,81 \ln(t) + 2252,3)$	0,99
Costs of regions	$y = 0,45769 \text{ AMS}^{1,182742} \text{ Population}^{-0,37}$	0,87
Intergovernmental transfers	$y = 0,45793 \text{ AMS}^{1,00286} \text{ Population}^{0,01585}$	0,83
Population	$y = 1444630 + 240t$	–

Note. t — time variable ($t = 1$ matches year 2011).

Table 3

The results of modeling scenarios of financial resources decentralization on the example of Kharkiv

Criteria	Scenarios	Years						
		2014	2015		2016		2017	
1	2	3	4		5		6	
Budget's dependence index, %	Actual value	0,24	\bar{y}	σ_e	\bar{y}	σ_e	\bar{y}	σ_e
	scenario 1		33,95	0,47	34,99	0,62	36,93	0,3
	scenario 2		40,05	0,49	40,83	0,63	42,61	0,29
	scenario 3		20,96	0,41	21,62	0,59	23,89	0,76
	scenario 4		20,15	0,21	20,32	0,36	21,92	0,69
Level of budget balance, %	Actual value	0,81						
	scenario 1		66,05	0,47	65,01	0,62	63,07	0,3
	scenario 2		59,95	0,49	59,17	0,63	57,39	0,29
	scenario 3		79,90	0,63	78,69	0,69	76,19	0,81
	scenario 4		82,32	0,63	80,93	0,71	78,33	0,83
Losses mln. UAH	Actual value	98,76						
	scenario 1		188,96	2,55	209,89	3,51	241,64	2,05
	scenario 2		221,83	2,70	243,21	3,76	278,16	1,87
	scenario 3		117,31	2,09	129,20	3,37	156,11	4,88
	scenario 4		114,98	0,74	122,82	1,69	143,46	4,35

Note. \bar{y} — the average values for the series of simulation experiments; σ_e — standard error of mean.

Table 4

Scenario options of securing tax revenue for the budget of Kharkov, mln uah

Indicators	2015		2016		2017	
	Forecast	Forecast error	Forecast	Forecast error	Forecast	Forecast error
Common for all scenarios						
TR	7 189,34	25,869	7 638,59	13,506	8 050,59	8,285
ITE com	13,35	0,980	14,41	0,570	13,28	1,222
ST	426,79	3,049	470,33	4,502	511,21	3,557
LT	447,68	3,701	497,60	4,266	540,95	5,119
TPI	2 927,37	9,412	3 049,15	10,125	3 152,46	12,876
IT	1 578,76	50,967	1 658,65	40,807	1 716,24	56,287
VAT	2 157,14	69,825	2 266,59	55,905	2 345,49	77,114
ET rs	134,29	0,944	138,66	0,702	142,35	0,511
Scenario 1						
IGT	2 415,16	33,364	2 663,03	46,936	2 976,37	24,054
OR	4 697,33	33,364	4 946,93	46,936	5 065,93	24,054
TPI lb	2 195,53	9,412	2 286,86	10,125	2 364,34	12,876
FSUNR lb	433,96	10,260	419,16	7,963	419,36	9,143
Losses	188,09	2,598	208,44	3,674	241,61	1,953
Scenario 2						
IGT	2 848,46	34,697	3 107,19	47,949	3 426,60	22,988
OR	4 264,03	34,697	4 502,77	47,949	4 615,70	22,988
TPI lb	1 756,42	8,124	1 829,49	9,257	1 891,47	10,653
FSUNR lb	301,59	7,140	293,21	5,842	294,18	6,677
Losses	221,83	2,702	243,21	3,753	278,16	1,866
Scenario 3						
IGT	1 506,28	26,810	1 650,60	43,092	1 923,12	60,082
OR	5 683,06	44,646	5 988,00	52,664	6 127,47	65,305
TPI lb	1 756,42	8,124	1 829,49	9,257	1 891,47	10,653
FSUNR lb	301,59	7,140	293,21	5,842	294,18	6,677
IT lb	321,34	8,768	336,29	6,948	342,29	11,760
VAT lb	1 097,70	30,031	1 148,93	23,796	1 169,47	40,279
Losses	117,31	2,088	129,20	3,373	156,11	4,877
Scenario 4						
IGT	1 476,42	9,528	1 569,15	21,614	1 767,20	53,679
OR	5 855,23	44,621	6 158,53	53,978	6 299,20	66,450
TPI lb	1 756,42	8,124	1 829,49	9,257	1 891,47	10,653
FSUNR lb	430,84	10,201	418,87	8,346	420,26	9,538
IT lb	803,34	21,921	840,74	17,369	855,73	29,401
VAT lb	658,62	18,019	689,36	14,278	701,68	24,168
Losses	114,98	0,742	122,82	1,692	143,46	4,358

on four scenarios, and losses incurred in transferring of budgetary funds are presented in Table 4.

8. An analysis of the simulation results shows that in scenario 2 (government) the budget dependence index and the level of the budget balance deteriorated in comparison with pre-existing conditions in 2014 (Figure 4, 5). Also, the losses linked with time delays of transfers significantly increase. The tax revenue from the profits

of enterprises do not compensate budget losses caused by the reallocation of the on individual income tax. The role of the retail sales excise tax in general is extremely small, its share in its own budget revenue is of 2,7–2,8 %.

According to Figure 4, 5, Table 3–4 and the key performance indicators (the budget dependence index and the level of the budget balance) scenario 4 is the most efficient of the options.

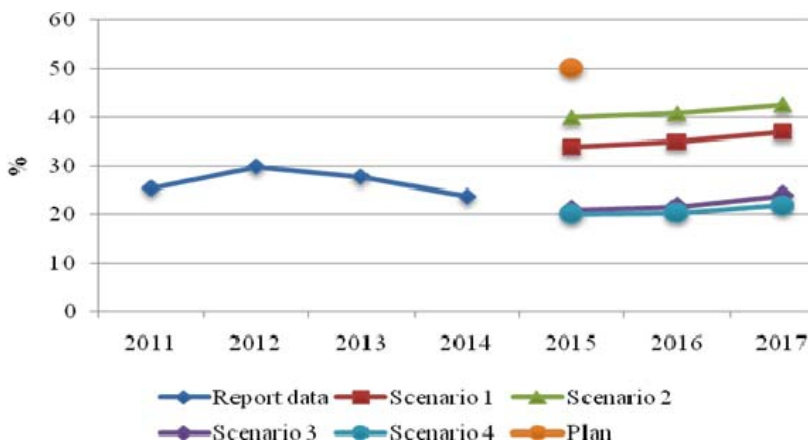


Figure 4. Budget's dependence index dynamics under different scenarios of tax revenue allocation between the budgets of different levels (for example, Kharkiv)

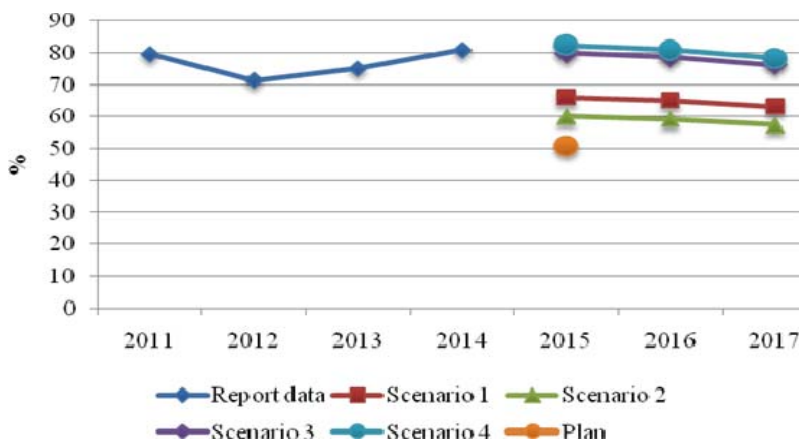


Figure 5. The level of the budget balance dynamics under different scenarios of tax revenue allocation between the budgets of different levels (for example, Kharkiv)

However, in general, the dynamics of these indicators is negative, due to the growing trend towards deterioration of macroeconomic indicators (reduction of the gross regional product, decline in industrial production, significant decline in real wages and purchasing power, and others). Therefore, the implementation of fiscal decentralization only fails without a number of reforms in the sphere of fiscal decentralization, deregulation and business development, regional policy, and anti-corruption reforms.

Empowerment of local governments, transfer of some powers to the field will stimulate development of small businesses, industries, whereby one observes an increase in the share of own and fixed sources of income in the local budgets and reduction of the share of transfers.

Partial compensation is made in possible to achieving an increase in the share of local budgets in the corporate income tax to 20 % while increasing the share of the fee for special use of natural resources (as in the third scenario). Improvement of budget dependence and budget balance indices in comparison with the retrospective period is achieved in the fourth scenario.

Conclusions. Thus, as a result of studies the impact of regional fiscal policy in the context of decentralizing financial self-sufficiency of the regions is substantiated. The methodical approach to modeling scenarios of the tax component of adjusting the regional fiscal policy, which consists of five interrelated sequential steps (setting goals; building a model of the tax component of adjusting the regional fiscal policy; identification of the factors influencing the financial sustainability of regional development; identification of scenarios of tax revenue allocation between the budgets of different levels; consideration of potential risks; forming performance criteria of financial resource decentralization and checking them for

scenario compliance; scenario modeling; selection of the most rational scenario in accordance with the economic, social, and organizational effectiveness.

In order to identify the most effective options for the tax component of adjusting the regional fiscal policy, four possible scenarios have been considered: the scenario for 2011–2014 years; the government scenario for 2015; 2 scenarios proposed by the authors in terms of securing a share of national taxes to local budgets. For each scenario risks and related loss of budgetary funds are taken into account: time, transactions, risks of corruption.

A simulation model of the dynamics of financial resources in the region using the example of the local budget of Kharkov is built in the Vensim medium in order to simulate scenarios.

Modeling proposed options of scenarios shows that in scenario 2 the budget dependence index and the level of the budget balance have deteriorated in comparison with pre-existing conditions in 2014. The improvement of budget dependence and budget balance indices in comparison with the retrospective period is achieved in the fourth scenario, in which the most active regulator acts as a tax component of fiscal policy. The volume and proportion of inter-governmental transfers and the related losses reduce. Legislative consolidation of the responsibility for implementing the real-locating functions will enhance their effectiveness.

Thus, formation of a rational structure of the revenue part of local budgets requires an increase in the share of tax revenue with a corresponding decrease in the share of transfers. The list of taxes, partly belonging to local budgets should include primarily those taxes which the tax base can be influenced by local authorities.

Further investigation of this issue lies in developing the mechanism of formation of regional financial self-sufficiency on the principles of fiscal federalism.

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Информация об авторах

Иванова Ольга Юрьевна — кандидат экономических наук, доцент, старший научный сотрудник, Научно-исследовательский центр индустриальных проблем развития Национальной академии наук Украины, 61022, Украина, г. Харьков, пл. Свободы, 5, Госпром, подъезд 7, этаж 8, e-mail: laptevaou@gmail.com.

Полякова Ольга Юрьевна — кандидат экономических наук, доцент, старший научный сотрудник, Научно-исследовательский центр индустриальных проблем развития Национальной академии наук Украины, 61022, Украина, г. Харьков, пл. Свободы, 5, Госпром, подъезд 7, этаж 8, e-mail: polya_o@ukr.net.

Authors

Olga Yu. Ivanova — PhD in Economics, Assistant Professor, Senior Research Worker, Research Center of Industrial Problems of Development of National Academy of Sciences of Ukraine, 5 Svoboda Squ., Gosprom, entr. 7, floor 8, 61022, Kharkov, Ukraine; e-mail: polya_o@ukr.net.

O. Yu. Polyakova — PhD in Economics, Assistant Professor, Senior Research Worker, Research Center of Industrial Problems of Development of National Academy of Sciences of Ukraine, 5 Svoboda Squ., Gosprom, entr. 7, floor 8, 61022, Kharkov, Ukraine; e-mail: polya_o@ukr.net.